E. H. LUNKEN & C. M. CONKLIN.

FIREPROOF WINDOW CONSTRUCTION.

APPLICATION FILED FEB. 11, 1908.

902,979.

Patented Nov. 3, 1908.

5 SHEETS—SHEET 1.

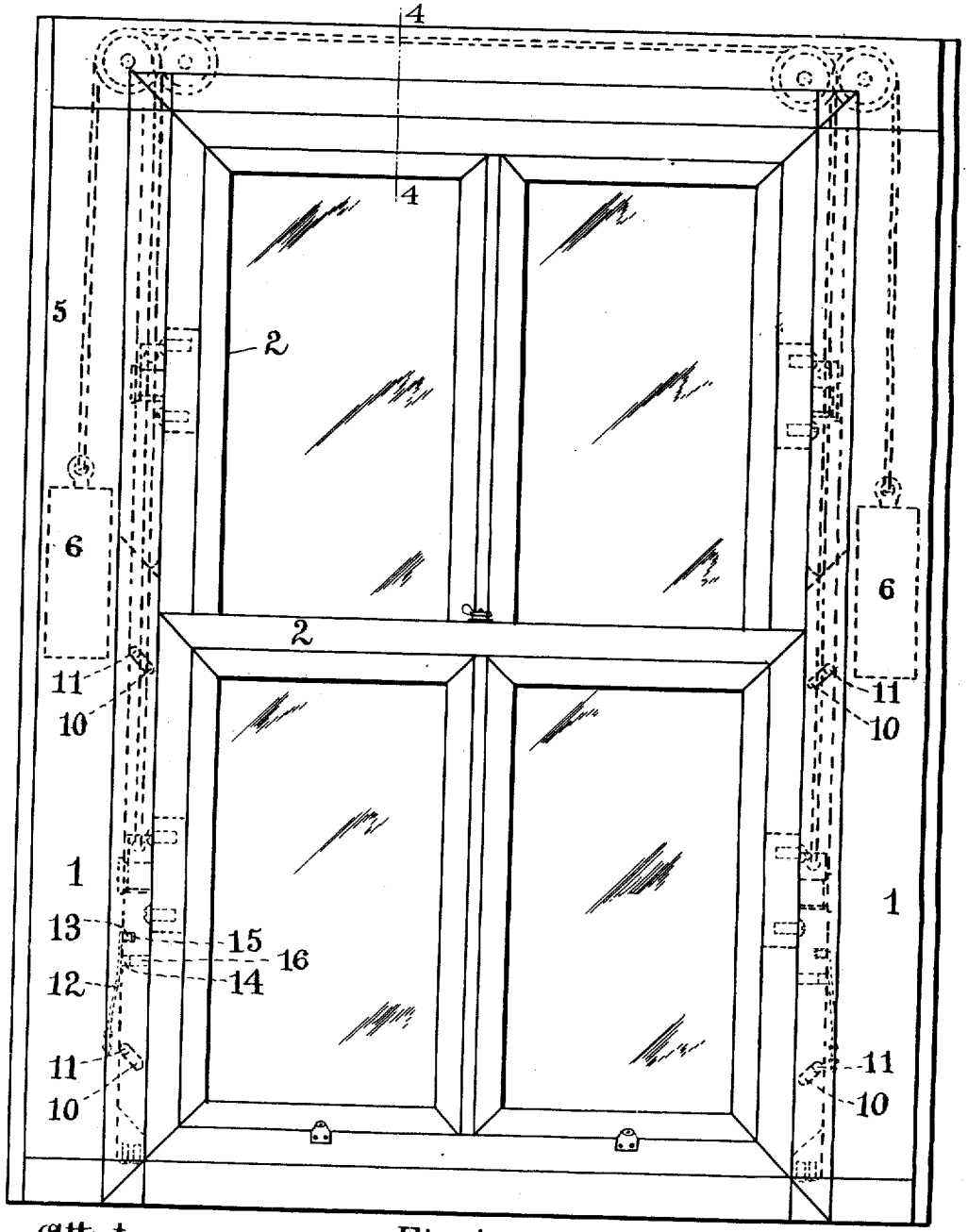


Fig. 1.

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Bentley Stahl.

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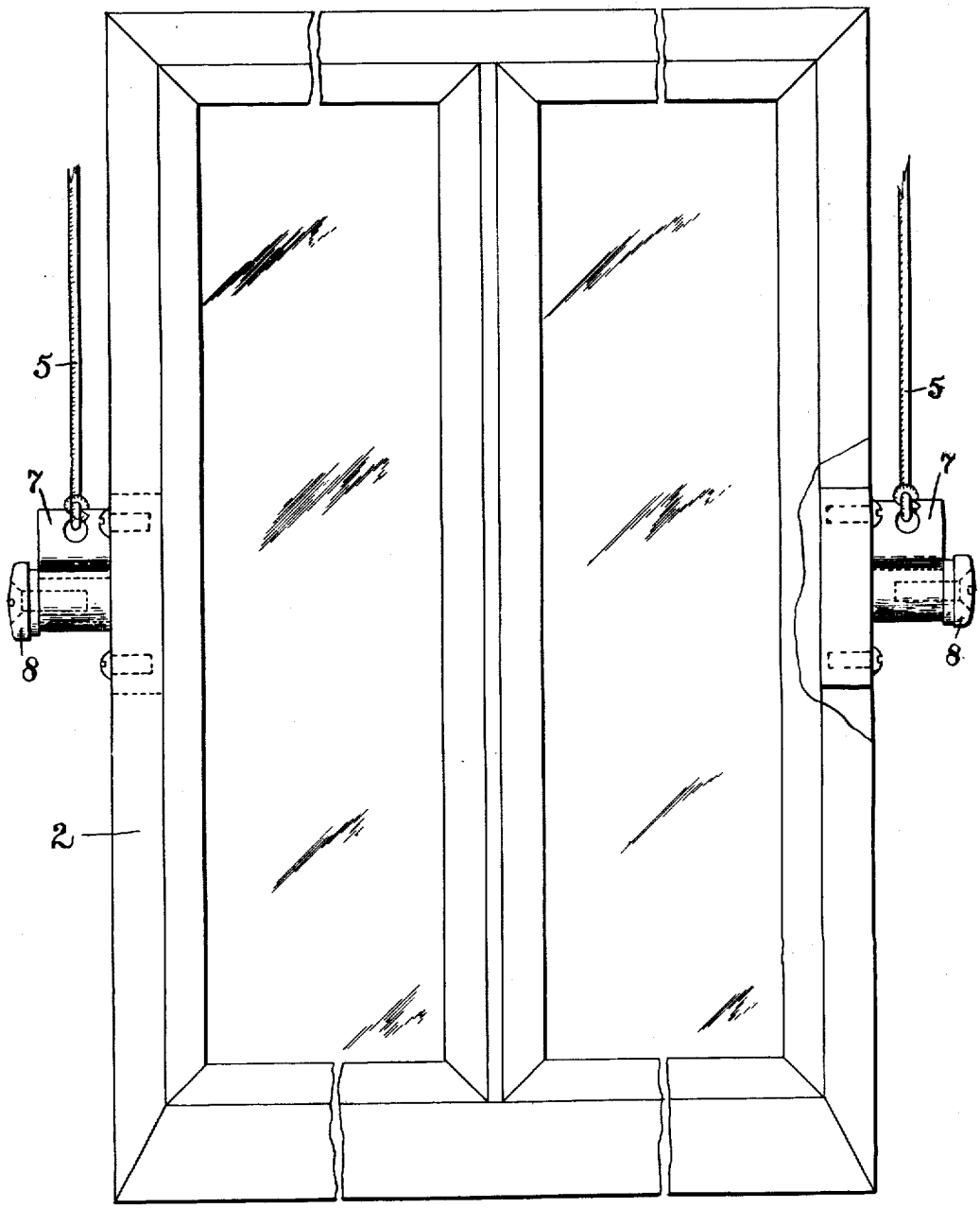


Fig. 2.

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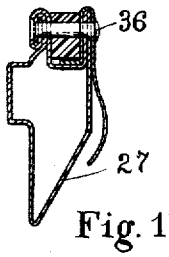


Fig. 12.

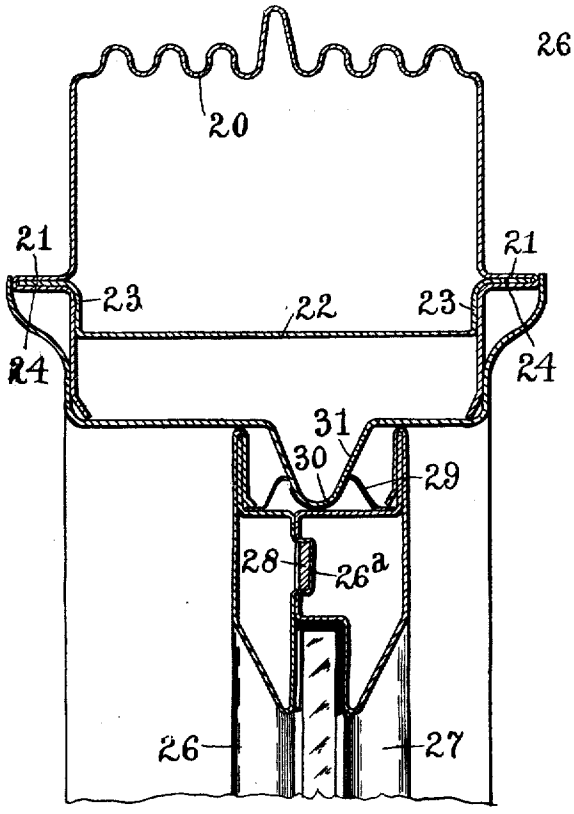


Fig. 4.

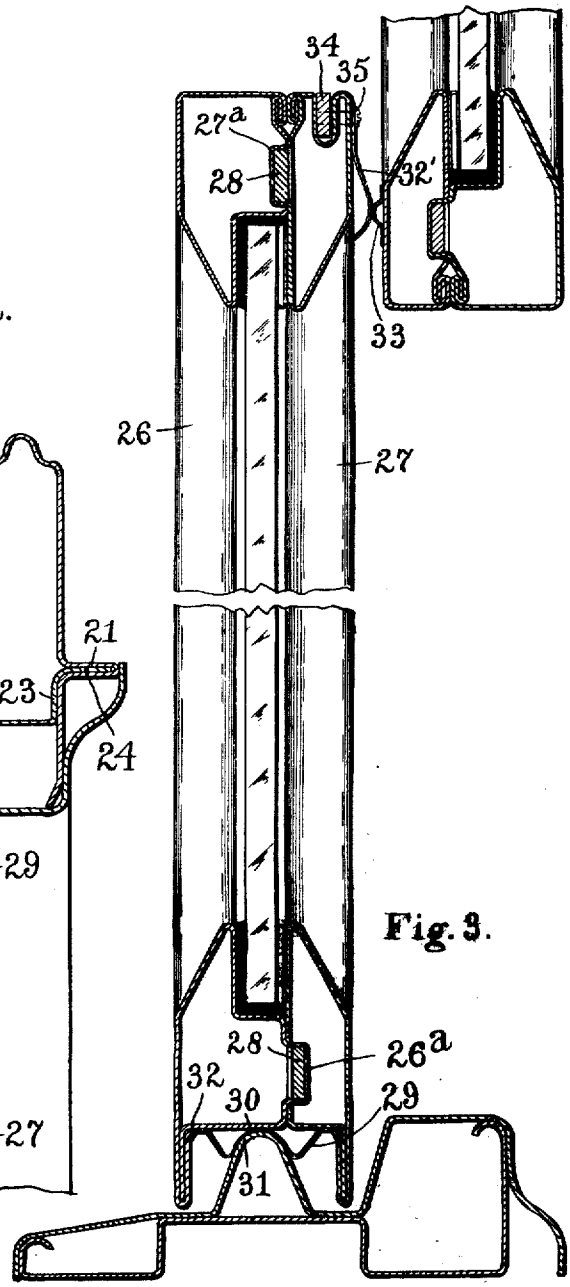


Fig. 3.

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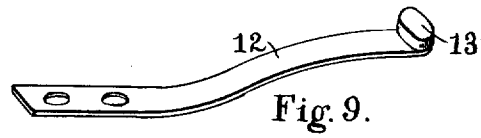


Fig. 9.

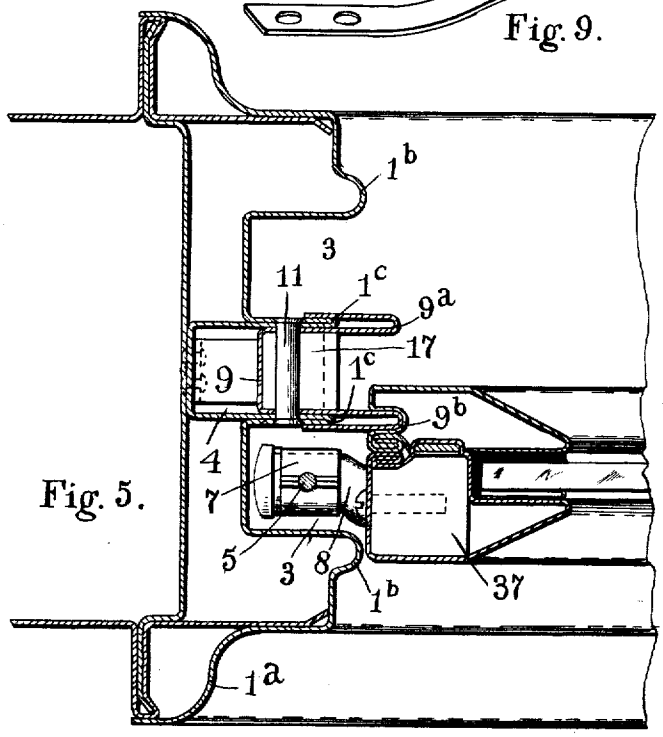


Fig. 5.

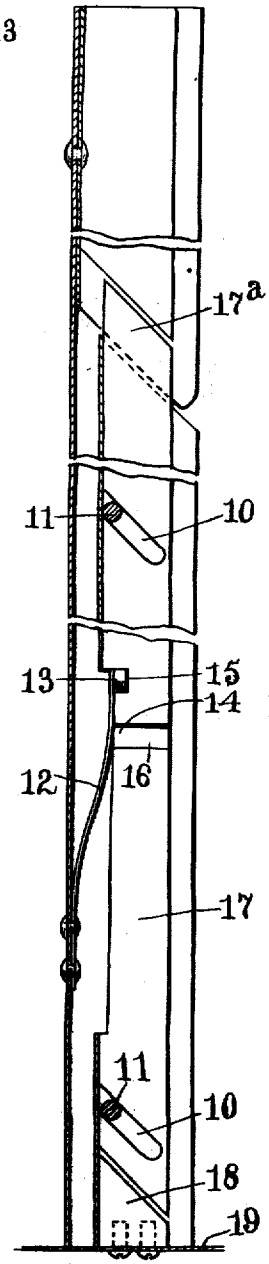


Fig. 6.

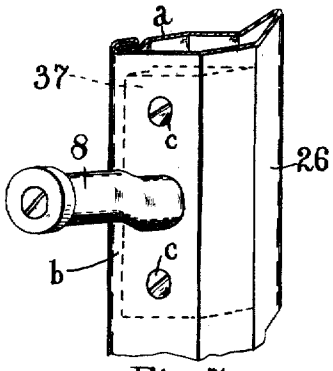


Fig. 7.

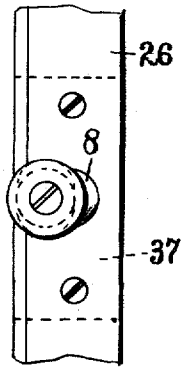


Fig. 8.

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5 SHEETS—SHEET 5.

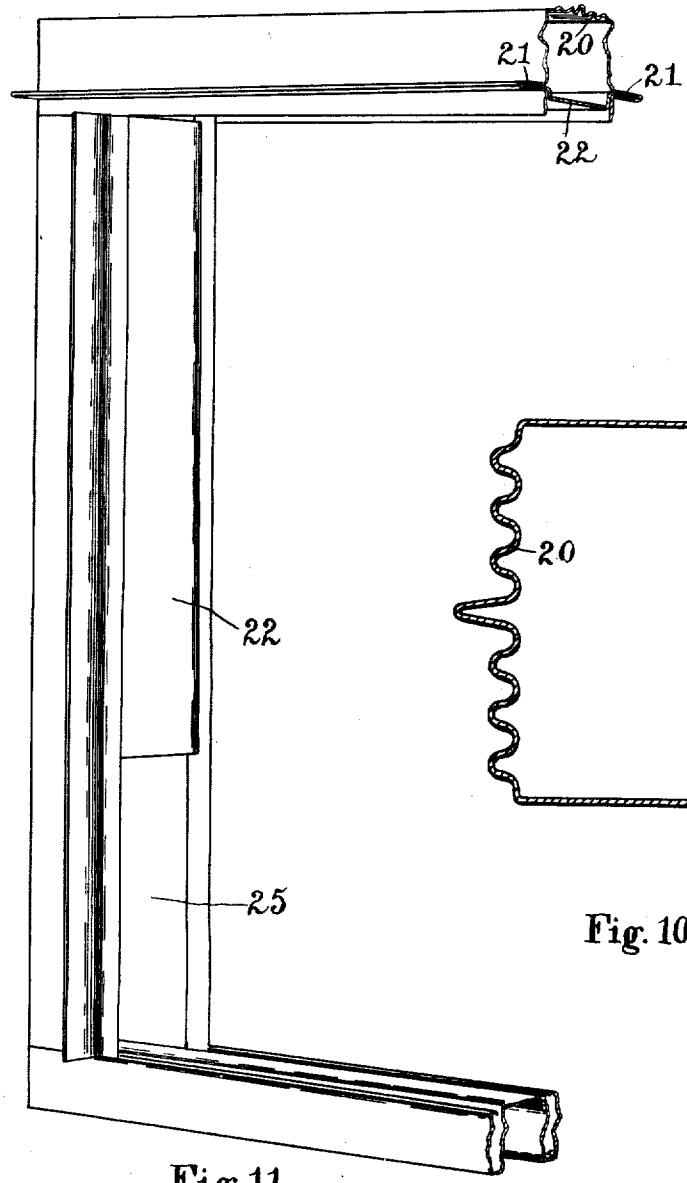


Fig. 11.

Fig. 10.

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UNITED STATES PATENT OFFICE.

EDMUND H. LUNKEN AND CHARLES M. CONKLIN, OF CINCINNATI, OHIO, ASSIGNORS TO THE LUNKEN STEEL WINDOW COMPANY, OF OHIO.

FIREPROOF WINDOW CONSTRUCTION.

No. 902,979. Specification of Letters Patent. Patented Nov. 3, 1908.

Application filed February 11, 1908. Serial No. 415,446.

To all whom it may concern:

Be it known that we, EDMUND H. LUNKEN and CHARLES M. CONKLIN, citizens of the United States, residing at Cincinnati, Ohio, have invented certain new and useful Improvements in Fireproof Window Construction, of which the following is a specification.

Our said invention relates to improvements in fireproof window construction such as forms the subject of an application filed by ourselves in the United States Patent Office on the 4th day of November, 1907, Serial Number 400700.

Among the objects of the present invention are the following:—

First, to provide a construction in which the sash shall be guided and held by a tongue and groove joint separate and distinct from the groove in which the pivot travels.

Second, to provide special forms of joints or weather strips for securing tight joints in a simple and economical manner.

Third, to provide a simple and economical manner of removably connecting the two parts of the sash frame.

Fourth, to provide a simple economical means of moving the guide strips inward when it is desired to swing the sash, and, fifth, to provide a strong and simple manner of securing the hinge pintles.

With these and other objects in view the invention includes the features of construction and arrangement and combination of parts hereinafter described and particularly set forth in the appended claims.

An embodiment of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a complete window. Fig. 2 is a front elevation of the lower sash, partly broken away. Fig. 3 is a transverse vertical section through the lower sash, the lower part of the upper sash, and the sill plate. Fig. 4 is a section on line 4—4 of Fig. 1. Fig. 5 is a horizontal section through the side rail of the sash and the corresponding side of the window casing. Fig. 6 is a sectional detail view of one of the guide bars. Figs. 7 and 8 are detail views of the hinge pintles. Fig. 9 is a detail of a spring catch. Fig. 10 is a sectional view and Fig. 11 is a sectional perspective of the window frame with the cover plates removed, and Fig. 12 is a detail of weather strip construction.

Referring by reference characters to these drawings, the numeral 1 designates the window frame or casing and 2 the window sash. Both of these are constructed of fire proof material, preferably sheet metal, and each side of the window frame is provided with outer or side vertical channels 3, and a central or intermediate channel 4, which are preferably formed as integral parts of the removable cover plate 1^a of the frame 1. The sashes are supported by sash cords 5 designed to be counterbalanced by weights 6 in the usual manner, but as the manner of counterbalancing forms no part of the present invention, a more specific description thereof is deemed unnecessary.

The sash cords are connected to eye pieces 7 in which are journaled the hinge pintles 8 upon which the sash frame hinges or pivots, the eye pieces moving vertically in the channels 3, as the sashes are raised and lowered. These hinge pintles are provided with buffers or protectors which may conveniently be in the shape of rubber or fiber buttons, as indicated at 8^a.

The portions of the cover plates adjacent to and on each side of these channels are formed or struck up to produce outer beads or ribs 1^b which give an ornamental or finished appearance and inner ribs or webs 1^c which serve to retain or support the sash guiding means in the manner hereinafter described. This sash guiding means comprises bars 9—9 which are located on opposite sides of the window frame and are provided with ribs or flanges 9^a and 9^b which are adapted to engage with corresponding grooves or channels in the side edges of the upper and lower sashes respectively to guide them in their vertical movement.

Under normal conditions the ribs or flanges of the side bars rest in the channels of the sash in the manner shown in connection with the lower sash in Fig. 5, and thus maintain a tight weather proof joint at the edges of the sash, while permitting the latter to be freely raised and lowered in the same manner as the sliding sash of an ordinary window. When however, it is desired to swing the sash upon a horizontal axis for purposes of cleaning or ventilation, the flanges or ribs of the guide bars must be

moved out of engagement with the channels of the sash, at which time the latter may be freely swung upon the hinge pintles 8.

To enable the guide bars to be thus moved and yet held firm and weather proof, each is constructed of pressed metal in channel form with the parallel side walls of its body portion fitting snugly against the inner side walls or faces of the channel 4, while the outer edges of the channel bar are doubled back to embrace the webs intervening between the channels 3 and 4, the edges of these doubled back portions forming the ribs or beads 9^a and 9^b which engage the channels in the sashes. These side bars are preferably so arranged that they will normally be automatically held in engagement with the sash. A convenient manner of accomplishing this is shown in detail in Fig. 6 in which it will be seen that each bar is provided with upper and lower inclined slots 10 which are engaged by pins 11 extending between the walls of the channel 4 and having their ends secured by upsetting, as shown in Fig. 5.

The weight of the bars coupled with the inclination of the slots causes them to be drawn by gravity into sash engaging position, and they may be easily raised manually to effect the disengagement necessary to permit the swinging of the sash.

It is desirable, however, to provide means for locking the bars in either an elevated or a lowered position. A convenient manner of effecting this is to provide a spring 12 in proximity to each bar having one end secured by means, such as rivets to a stationary part of the frame and its other end provided with a projection 13 to engage the recesses 14 and 15 in the bar.

In order to enable the spring catch or detent to be released, a hole is made through the bar, preferably in line with one of the recesses, as indicated at 16, by which a rod or pin may be inserted to press back the spring.

It is not necessary that the movable guide bars 9 shall extend the full height of the window frame or casing. They may be made of a length approximately the height of one sash and the remaining portions of the guide ribs be rigid, and the swinging movement of the sash accomplished by sliding it from the rigid guide ribs on to the ribs of the movable bars.

In the preferred construction, we have shown the movable bars as coincident with the lower sash, which is thus in readiness to be swung on its horizontal pivots upon separation of the movable bars, while to swing the upper sash it would only be necessary to lower it on to the movable guide bars, the lower sash, of course having first been raised out of the way.

We have found it desirable to provide each guide bar with a reinforcing bar or strip 17 which stiffens it and adds weight, thereby assisting the action of gravitation. The ends of this and also the bar 9 are beveled or inclined to the same angle as are the slots 10.

At the upper end the bar 17 is preferably prolonged into the upper stationary guide bar so as to break joints and prevent any possible danger of the meeting edges of the movable and stationary guide bars springing out of line with each other, the extended part being indicated at 17^a.

The slight space at the lower inclined end of the bar 17 may be filled by a block 18 secured by screws or rivets to the sill plate 19 and having an inclined upper face which aids in supporting and guiding the movable bar.

The main frame or casing of the window is preferably made of pressed metal in channel form, one of the side members without the cover plate being shown in cross section in Fig. 10 and the top cross bar or member in cross section in Fig. 4.

The outer wall is corrugated longitudinally for strength as indicated at 20 and the side walls are provided with folds which form flanges 21 which also brace or stiffen the frame and serve as guides for the masons in walling in the frame. As clearly shown in Fig. 4, the cover plate embraces the sides of the front edges of the frame member and abuts against the flanges 21. This construction makes it desirable to provide a support against inward pressure, which we accomplish by bracing webs 22 having angular portions 23 bearing against the inner faces of the side walls, and edge portions 24 clamped between the folded portions 21. At the sides these bracing webs terminate above the bottom leaving spaces 25 for access to the weights.

The sash frame is shown as constructed mainly in accordance with the prior application hereinbefore referred to, of two hollow parts or bars 26 and 27 of sheet metal, between the flanges of which the glass is held.

The abutting portions of these bars 26 and 27 have overlapping parts, such as eye portions 26^a and 27^a struck from one part and entering corresponding cutaway portions or recesses in the other, bars or keys 28 being inserted into the eyes to key the parts together. The eyes of part of the rails are struck in one direction as shown at 26^a and of the other parts in the opposite direction as shown at 27^a. This brings the locking bars of adjoining rails out of alinement or in different horizontal planes.

We provide in this form of window construction, an exceedingly simple and desirable form of packing strip for the sill joint which is clearly shown in Fig. 3. This consists of a brass weather strip 29 having a cen-

tral groove or channel 30 to receive the sill rib 31. The strip 29 is inserted longitudinally of the bottom rail, being guided and held by the angularly turned edges 32 of the sheet metal of which the bottom bar is formed.

If desired, the strip 29 can be made of spring metal so as to have some spring or yielding action.

We provide also an exceedingly simple and efficient form of weather strip for the meeting rails shown at the top of Fig. 3. This consists of a spring strip 32′ carried by the upper rail of the lower sash and designed to abut against a brass strip 33 soldered or otherwise suitably secured to the face of the lower rail of the upper sash. The strip 32′ is constructed with a folded over portion which fits into a groove or slips onto the lock seam in the top rail of the lower sash where it is held by a bar or strip 34 and screws 35.

A modification is shown in Fig. 12 in which rivets 36 are used to receive the weather strip and bar, the rivets passing through both side walls of the groove or channel.

It is necessary to provide a strong and durable connection between the hinge pintle 8 and the sheet metal sash frame. This is accomplished in a desirable manner by the use of a block 37 preferably formed integral with the pintle by drop forging. The block is inserted through a cutaway portion of the inner wall *a* of the member 26 before the two members of the sash frame are brought together, a slot being provided in the side wall *a* to permit the passage of the pintle 8. After having been thus inserted the block is secured to the edge wall *b* by rivets *c*, thereby avoiding having any rivets show on either face of the sash.

Having thus described our invention, what we claim is:

1. In combination, a window frame having each of its side members constructed of sheet metal folded to form two channels with an intermediate groove or recess, a movable bar for each recess, said bar having a part seated in the recess and side parts or flanges extending into and bearing against the adjoining walls of the channels, upper and lower sashes adapted to have a sliding engagement with said movable bars, hinge pintles carried by the sashes and engaging said channels, and counterbalancing means connected with said pintles.

2. In combination a window frame having each of its side members provided with intermediate and two side channels with intervening webs, a bar movably seated in each intermediate channel and having side flanges embracing said webs, and upper and lower sashes having a sliding engagement with said bars.

3. In combination, a window frame having vertical channels, an upper and a lower sash having hinge pintles engaging said channels, bars carried by one portion of the frame and movable in the plane of the sash towards and from the edges of the sash, complementary bars rigidly carried by the remaining portion of the frame, said sashes having tongue and groove engagement with the movable and rigid bars, and counterbalancing means connected to the hinge pintles.

4. In combination, a window frame having vertical channels in its side walls, movable bars carried by one portion of the frame, rigid complementary bars carried by the remaining portion, said rigid and movable bars having inclined abutting ends, inclined slot and pin connections between the movable bars and frame, sashes having sliding engagement with said rigid and movable bars, hinge pintles carried by the sashes and engaging the channels, and counterbalancing means connected with the pintles.

5. In combination, a sheet metal frame member having a corrugated outer face and side faces provided with folded portions forming flanges, and a bracing web having its edges held by said folded portions.

6. In combination, a side frame member of channel shape and having a corrugated outer face, a bracing web extending between the side walls of the frame member, said bracing member providing a weight chamber and terminating above the bottom of the frame member to permit access to the weight, and a removable cover plate having side portions or flanges embracing the sides of the frame member.

7. In combination, a sash comprising two frame members, each consisting of hollow sheet metal bars with their inner faces in contact and having glass retaining means one bar of one member having struck up portions passing through corresponding openings in the second member, a bar of said second member having inwardly struck portions passing through openings in the first member, locking keys inserted through said inwardly struck portions, said keys lying in different vertical planes.

8. In combination, a sill having a rib or flange, a sash, having a lower bar of sheet metal with a channel therein, a weather strip located therein having a groove to receive the edge of the rib or flange the sheet metal forming the lower bar having edge or flange portions engaging the edges of the weather strip.

9. In combination, a sash composed of two separate frame members suitably secured together, the lower bars of said frame members forming a channeled lower edge, and a weather strip longitudinally disposed in said channeled edge and longitudinally

removable therefrom, substantially as described.

10. In combination, a sash composed of two separate frame members suitably secured together, the top bar or rail of one of the frame members having a groove, a weather strip having a folded part seated within the groove, a retaining strip seated in the groove, and means for securing the retaining strip and weather strip within the groove of the separate frame member, substantially as described.

11. In combination, a sash having a top bar or rail of sheet metal folded to form a groove, a weather strip having a folded part seated within the groove and embracing the edge of the sash, a retaining bar seated in and filling the groove and rivets or the like passing through the top bar strip and retaining bar.

12. In combination, a window frame having vertical channels, a sash composed of two separately connected frame members, blocks secured to one of said frame members on opposite sides, hinge pintles carried by said blocks and engaging the channels of the frame and sash cords connected with said pintles.

13. In combination, a window frame having vertical channels, a sash composed of two separately connected frame members, blocks secured to and within one of said frame members on opposite sides, hinge pintles carried by said blocks and engaging the channels of the frame, and sash cords connected with said pintles.

14. In combination, a window frame having vertical channels in its side members, a movable bar carried by one portion of each of said side members, supplementary bars rigidly carried by the remaining portions of the side members, reinforcing members carried by the movable bars and overlapping the joint between the movable and rigid bars, sashes having hinge pintles engaging the channels and having a sliding engagement with the movable and rigid bars, and counterbalancing means for the sashes connected to the hinge pintles.

15. In combination, a window frame having vertical channels in its side members, a movable bar carried by one portion of each of said side members, supplementary bars rigidly carried by the remaining portions of the side members, said movable and supplementary bars forming sash guides, reinforcing members carried by the movable bars, and means at the top and bottom ends of the reinforcing members for guiding the movable bars.

16. In combination, a window frame having vertical channels in its side members, a movable channel bar carried by one portion of each side member, said channel bars having an inclined slot and pin connection with the side members and having inclined upper and lower ends, supplementary bars rigidly carried by the remaining portions of said side members and having inclined ends abutting the ends of the movable bars, and a sash guided by said movable and rigid bars.

In testimony whereof, we affix our signatures in presence of two witnesses.

EDMUND H. LUNKEN.
CHAS. M. CONKLIN.

Witnesses:
LAM THOMPSON,
WM. H. MUBUCH.